

Appl. No. 10/550,841
Amdt. Dated April 27, 2011
Reply to Office Action of October 27, 2010

REMARKS/ARGUMENTS

Applicants have submitted this amendment and Request for Continued Examination so that the Examiner may consider the alternate claims as modified herein. More specifically, Applicants have modified each of the independent claims to clarify the subject matter of the invention and broadly state its characteristic features. Additionally, new claims have been added which additionally specify the characteristic features of the present invention directed to the integration of the claimed fuel cell with the electronic device that is powered by the fuel cell in a common housing or casing. Applicants respectfully submit that there is no teaching or suggestion whatsoever regarding either the fundamental features of the invention or the new features now specified in the newly added claims.

First, in regard to the Examiner's rejections set forth under 35 U.S.C. § 112, first paragraph. Applicants respectfully submit that the original specification provides more than ample description so that a person of ordinary skill in the art would reasonably understand the invention in light of the original disclosure. Applicants acknowledge that the Examiner has asserted that the previously added limitation directed to "the electronic device performing operations that are not related to the generation or transfer of electrical energy from the fuel cell" was not present in the original specification.

Contrary to these assertions, Applicants respectfully submit that numerous portions of the original specification describe in detail these aspects of the present invention. Indeed, the exemplary embodiment is directed to a

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personal computer or laptop wherein the fuel cell and the computer are located in a common housing and the fuel cell provides power to the computer while the CPU of the computer advantageously serves as a source of heat generation that is used by the fuel cell.

For example, page 8 of the original specification at lines 17-23 indicates that Figure 1 is a block diagram showing a computer 10 according to the present embodiment. The computer 10 includes a central processing unit (CPU) 11, a fuel cell system 19 supplying electric power for driving the CPU 11, and a casing 12 for housing these components. The computer 10 and the fuel cell system 19 are housed in the casing 12 that is integrated.

Lines 24 and following indicate that the CPU 11 is a semiconductor device that is operated upon receiving a supply of electric power from the fuel cell system 19. During operation, the CPU 11 generates heat. That is, when the CPU 11 operates for the computer 10, the CPU generates heat and thus the CPU functions as a source of heat generation.(that is used by the fuel cell)

Further examples of support for the claim limitation are found on page 21 of the original specification beginning at line 11. This portion of the specification notes that in the description of the embodiment, the computer 10 is used as an example of the electrical equipment. However, electrical equipment according to the invention is not limited to the exemplary computer and may be, for example, a projector in an alternate embodiment. The projector of course includes a lamp as a light source and the temperature of the lamp is very high when illuminated. The heat generated from the lamp is advantageously used for controlling the temperature of the fuel cell system. Consequently, as in the case with the

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computer 10, waste energy which is conventionally exhausted as a thermal output can be effectively utilized in accordance with the present invention. Accordingly, as noted in the specification, in addition, when the projector is driven with a fuel cell as electronic power source, a power generation efficiency of the fuel cell is also improved. See, for example, lines 11-24 on page 21 of the original specification.

Accordingly, Applicants respectfully submit that the Examiners assertions forming the basis for the rejections set forth under 35 U.S.C. § 112 are misplaced and that the rejections should therefore be withdrawn in light of the portions of the specification noted above.

Applicants respectfully request reconsideration of the prior art rejections set forth by the Examiner under 35 U.S.C. sections 102 and 103. Applicants respectfully submit that the prior references of record, whether considered alone, or in combination, fail to either teach or suggest Applicants' presently claimed invention. More specifically, Applicants note that in contrast with the prior art, the present invention is directed to be thermally integrated electronic device and fuel cell structure wherein the electronic device receives its electrical power from the fuel cell and the electronic device generates heat that is transferred back to the fuel cell for use by the fuel cell. The thermal integration of these two separate devices advantageously and synergistically aids in the cooling electronic device such as a CPU, computer or projector.

In contrast with the present invention, Leboe merely describes systems and methods for regulating the temperature of a self-contained fuel-cell device. There is simply no disclosure or suggestion whatsoever in this reference or any

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other reference that a separate electronic device that operates independently from the fuel-cell for another purpose should be powered by the fuel-cell and that the electronic device should feedback heat for use by the fuel-cell.

As noted previously, the Leboe reference provides no teaching whatsoever regarding thermal integration of an electronic device that is powered by the fuel-cell. Significantly, the inventors of the instant application have recognized the significant synergistic relationship and advantageous improvement in overall efficiency. The required cooling electronic device such as a CPU or projector lamp synergistically is utilized by the fuel-cell for advantageously heating the fuel that is ultimately used by the system.

Additionally, Applicants have added new claims that alternately define the invention and distinguish over the prior art. These new claims specify the characteristic features of the present invention directed to the integration of the electronic device and the fuel-cell in a common housing. While Leboe does disclose a housing, the housing of this reference does not also incorporate the electronic device that is to be powered by the fuel-cell system. This stands in sharp contrast with the present invention that advantageously integrates these two separate elements and provides a synergistic result that none of the references of record teach or suggest.

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Accordingly, in light of the foregoing, Applicant's respectfully submit that all claims now stand in condition for allowance.

The Commissioner is hereby authorized to charge any fees due or to credit any overpayment to Deposit Account No. 50-3891.

Respectfully submitted,

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